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STATUS OF BALSAM WOOLLY APHID, ADELGES PICEAE (RATZ.)
ON ROAN MOUNTAIN, TOECANE RANGER DISTRICT,
PISGAH NATIONAL FOREST, N. C., 1974

By

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INTRODUCTION

The Roan Mountain Recreation Area covers about 5,000 acres of National Forest land in eastern Tennessee and western North Carolina. The mountain is well known for its scenic beauty and unusual plant and animal life. It is noted for having the world's largest rhododendron gardens (Rhododendron catawbiense) and also for the spruce fir type (Picea rubens and Abies fraseri), which cover the top of the mountain (Figures 1 and 2). The recreation area is managed by the Toecane District of the Pisgah National Forest in North Carolina and the Unaka District of the Cherokee National Forest in Tennessee.

The balsam woolly aphid, Adelges piceae (Ratz.) was introduced into the United States from Europe around 1900 and was detected in the southern Appalachian Mountains in 1957 (Speers, 1958). The aphid was found on Roan Mountain in 1962 (Ciesla and Buchanan, 1962). It has killed thousands of fir on the Roan but its impact has been reduced drastically by a vigorous suppression program carried out by the Toecane Ranger District.

Suppression methods used to reduce the impact of the aphid on Roan Mountain include removal of infestations through commercial Christmas tree sales, chemical spraying with lindane and silvicultural methods (Figure 3).

The purpose of this report is to present the current status of the balsam woolly aphid on Roan Mountain. The data for this report were collected by personnel from the Forest Pest Management Group at Asheville, N. C., and the Pisgah National Forest.

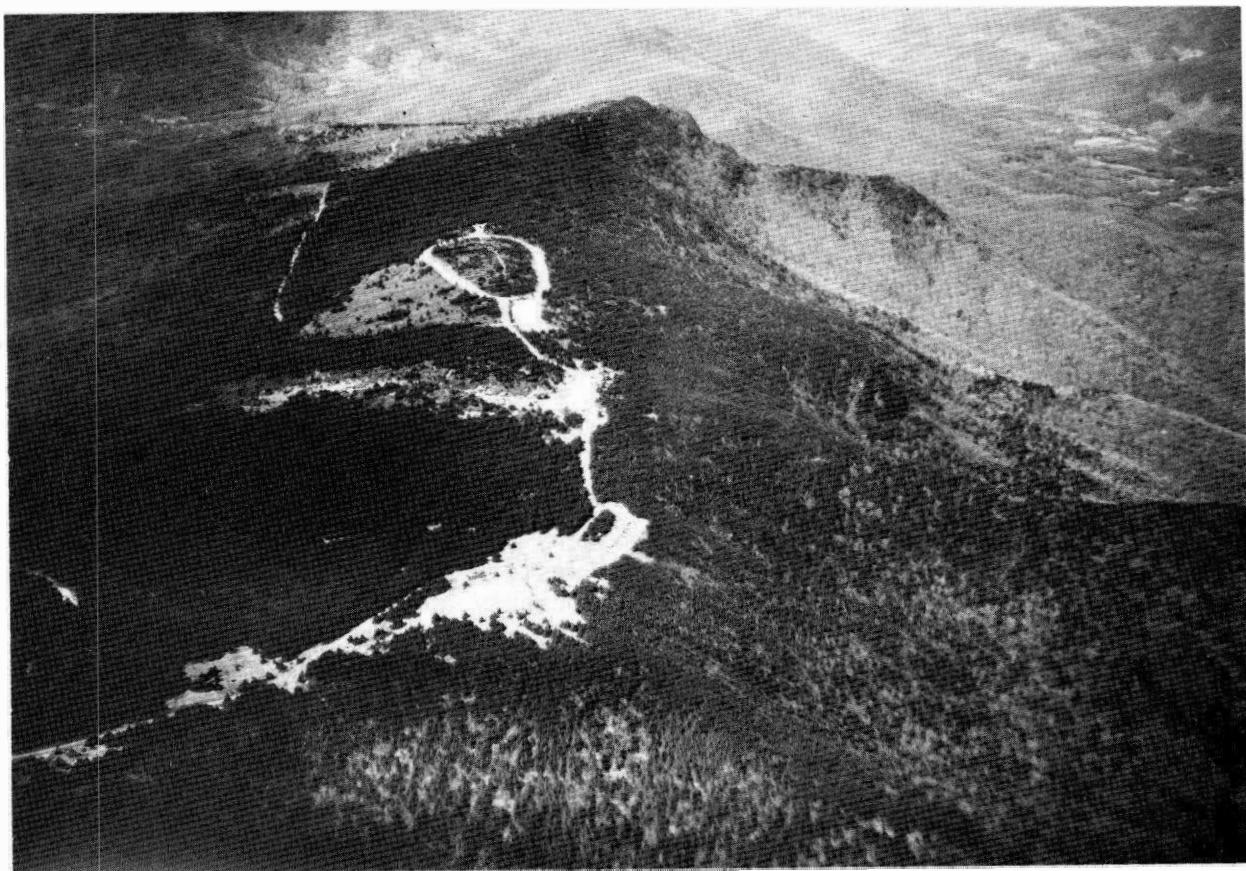


Figure 1. An aerial view of the western half of Roan Mountain showing spruce fir type and rhododendron gardens.

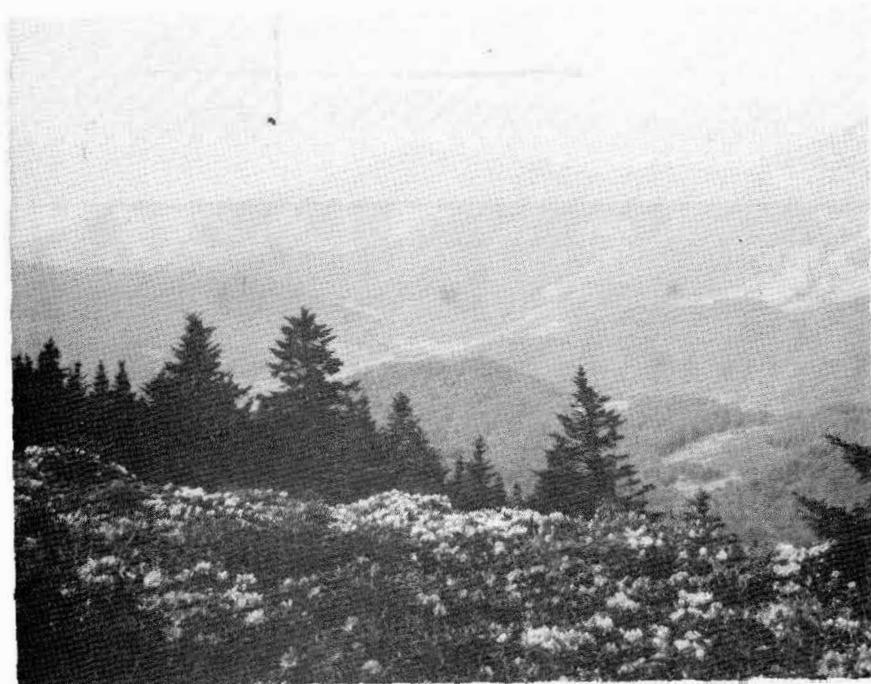


Figure 2. Combination of Fraser fir and rhododendron on Roan Mountain blend together to produce an unusual alpine setting.



Figure 3. Chemical suppression of balsam woolly aphid on Roan Mountain.



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Figure 4. Adults and neosistens of balsam woolly aphid on Fraser fir.

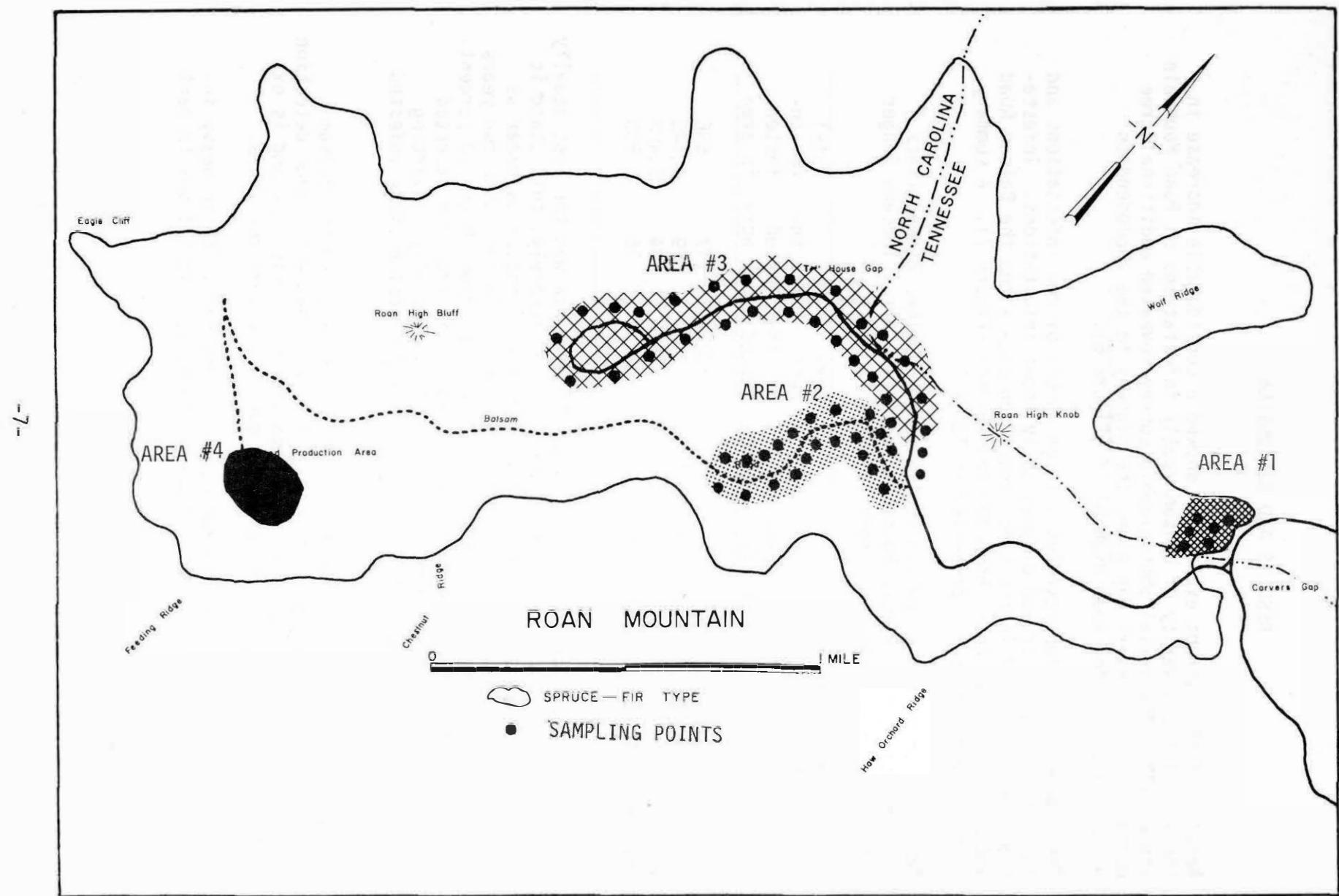


Figure 5. Location of four areas sampled for balsam woolly aphid infestations on Roan Mountain, Toecane District, Pisgah National Forest, 1974.

RESULTS AND DISCUSSION

Results of the current evaluation showed a considerable increase in the extent and severity of balsam woolly infestations on Roan Mountain since 1973. The aerial photographic survey revealed additional tree mortality near Carvers Gap along the highway to the rhododendron gardens and near the Roan High Bluff (Figure 6).

The ground evaluation revealed a large number of new infestations and an increase in the spread of previously known infestations. Infestations were detected in the seed production area along the Balsam Road and in the highly scenic Rhododendron Gardens (Figure 7). A summary of the ground cruise is presented in Table 1.

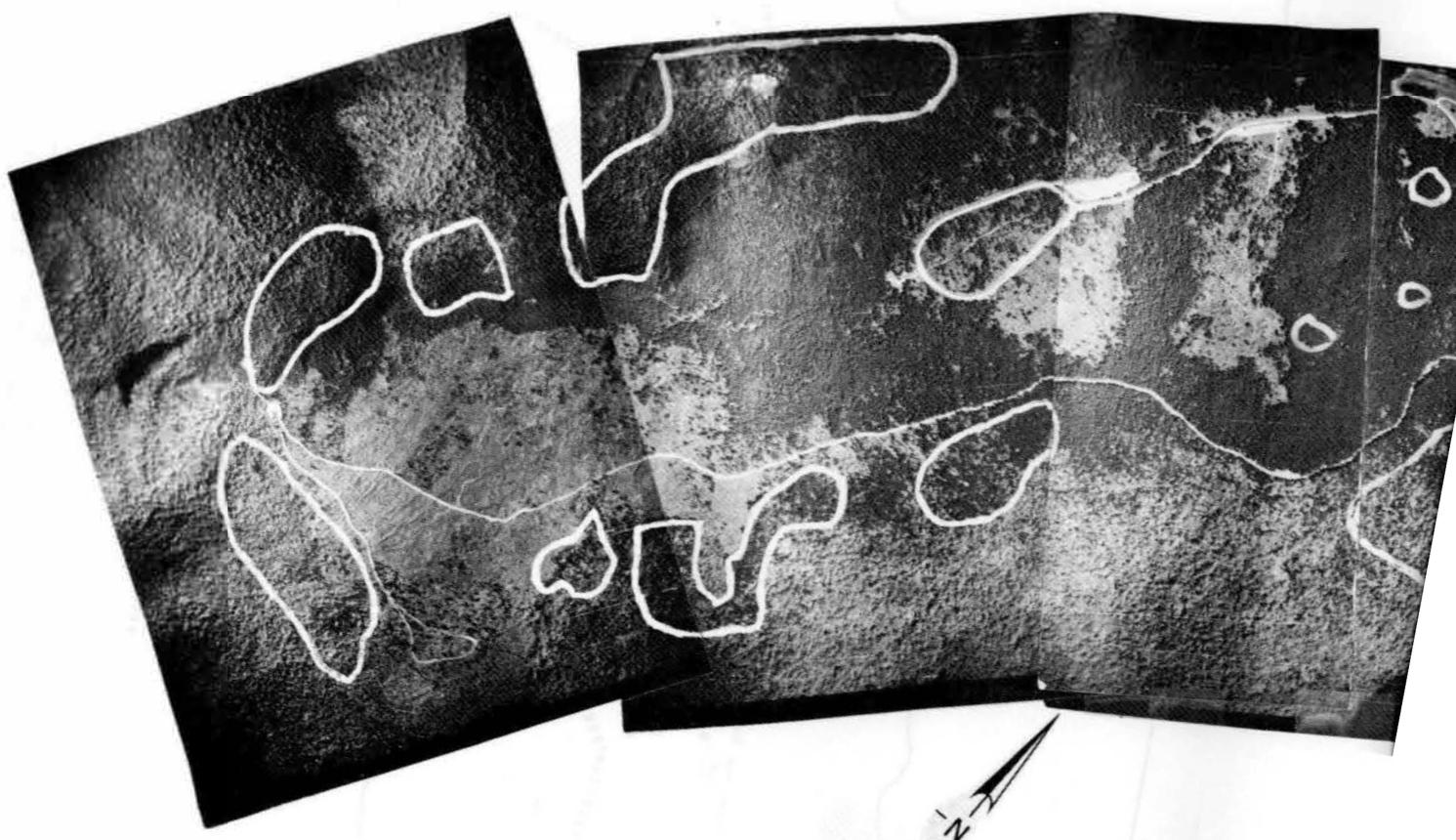
Table 1. Incidence of balsam woolly aphid, *Adelges piceae* (Ratz.) infestations in the Roan Mountain Recreation Area, Toecane Ranger District, Pisgah National Forest, 1974.

	Acres of host type in area	Stems per acre	Per cent fir	Per cent spruce	Per cent fir infested	No. fir infested per acre	Total no. infested in area
Area #1	5.6	368	32	68	100	117	656
Area #2	60.0	335	67	33	31	69	4,140
Area #3	52.0	334	85	15	36	104	5,408
Area #4	60.0	30	100	--	50	15	900

Area 1 which is located at Carver's Gap Picnic Area was the most heavily infested of the four areas ground checked. Fortunately, this stand is mostly red spruce so the impact of the aphid will not be as great as in the other areas which are predominantly fir. In less than two years the percent of infested trees increased from 10 to 100 percent. Most of the infested trees at Carver's Gap Picnic Area are expected to die during 1975 and 1976. The District is gradually converting this area to spruce by cutting and removing the most heavily infested fir.

Light to heavy infestations were found in Area 2 along the Balsam Road. The aphids were primarily in the upper crown which made detection very difficult. The aphid is well established in this area and is expected to cause severe tree mortality during the next two years.

Area 3 which includes the Rhododendron Gardens had light to heavy infestations scattered along the highway and heavy infestations in part of the gardens.



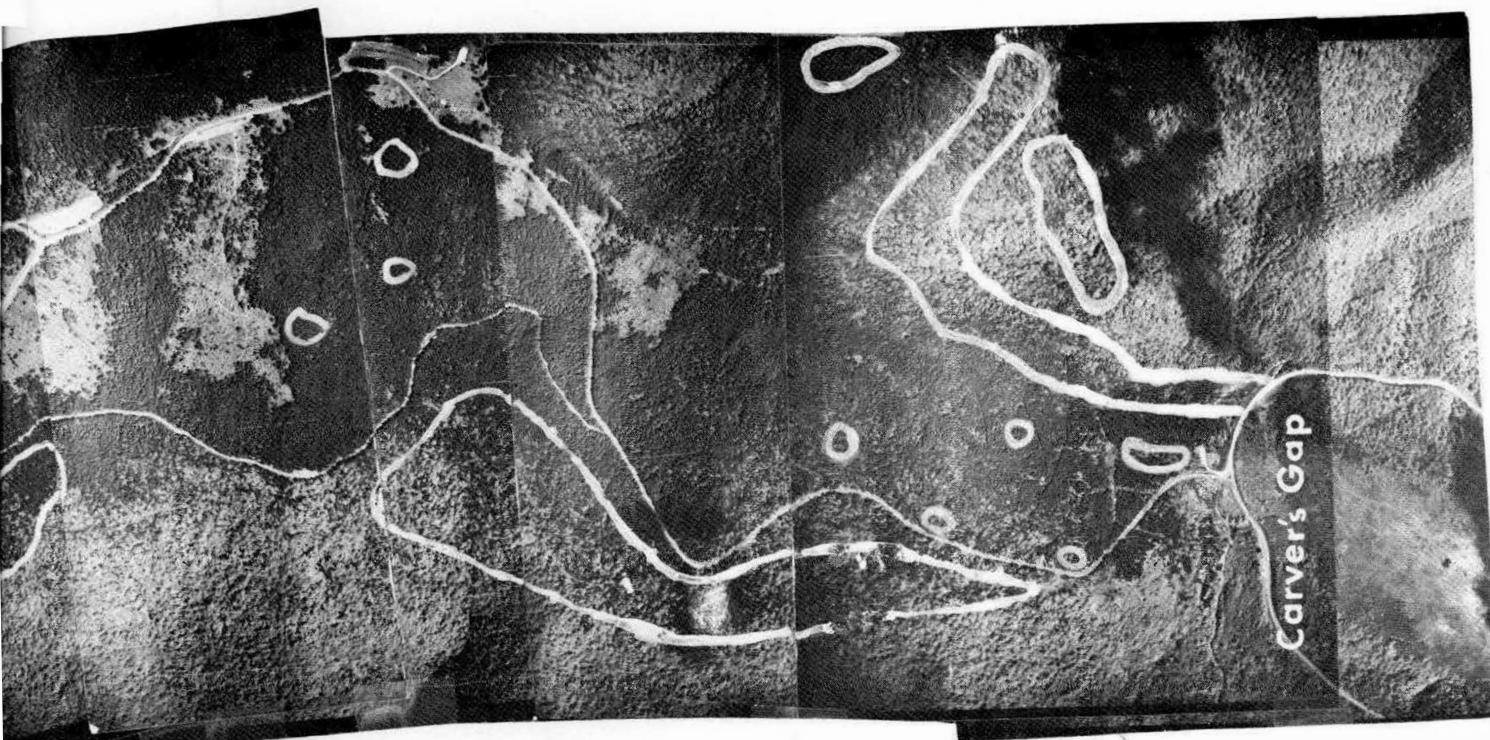


Figure 6. Location of areas on Roan Mountain containing significant Fraser fir, *Abies fraseri*, mortality caused by balsam woolly aphid, *Adelges piceae* (Ratz.).

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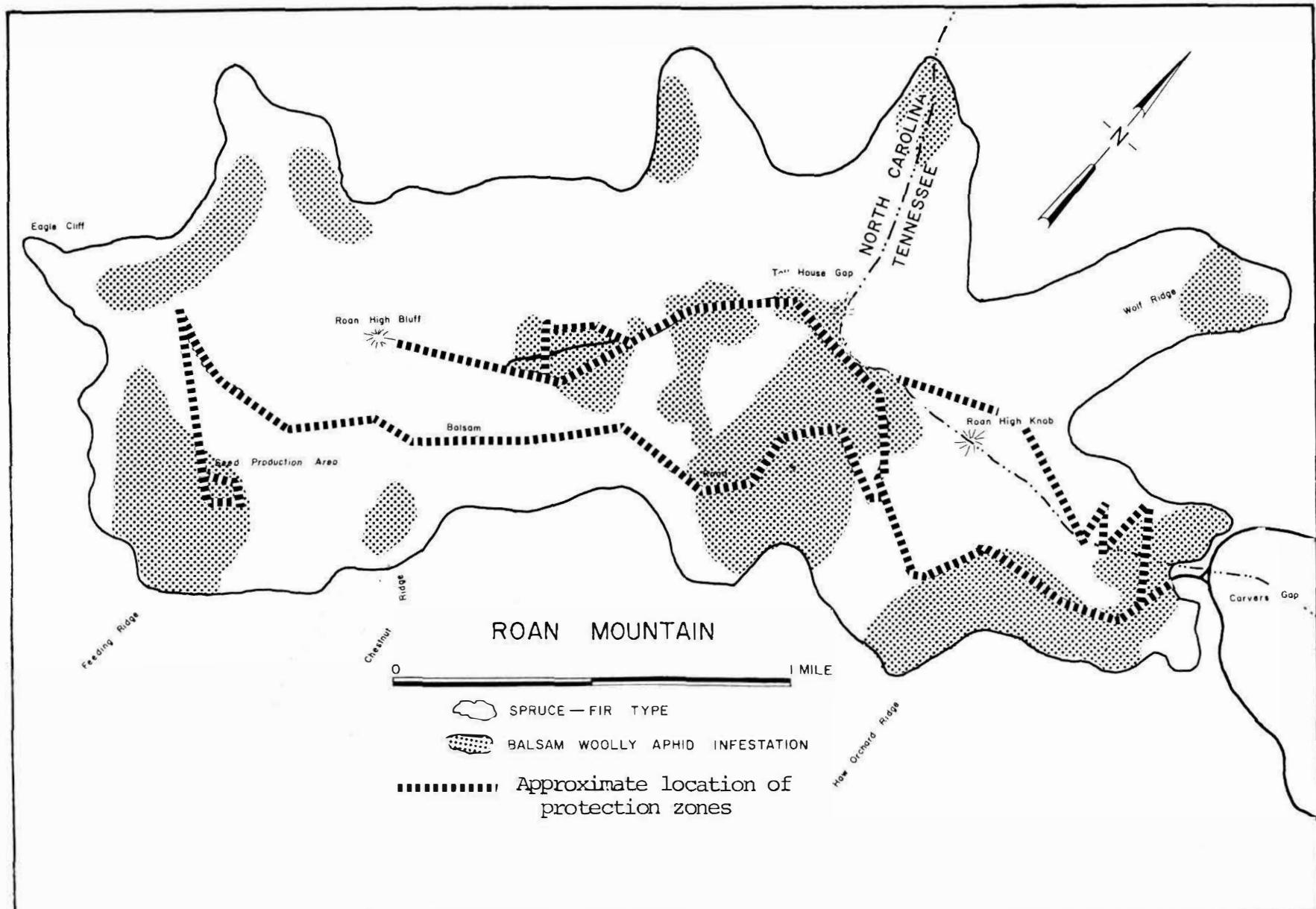


Figure 7. Location of balsam woolly aphid infestations on Roan Mountain, Toecane District, Pisgah National Forest, 1974.

The lower half of Area 4 (seed production area) was heavily infested, but no infestations were found in the upper half of the area. Unless the trees are treated, heavy tree mortality is expected to occur in 1975 or 1976.

Balsam woolly aphid infestations can be controlled by spraying a 1/8 percent emulsion of lindane in water. This spray can be prepared by mixing five pints of 20-percent lindane emulsifiable concentrate with enough water to make 100 gallons. The spray should be applied to the point of runoff on the entire bole and branches of infested trees. Spray can be applied any time from May to October with high pressure spray equipment. One treatment is generally sufficient for several years' protection.

PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key—out of the reach of animals—away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level isolated place.

REFERENCES

Amman, G. D. 1962. Seasonal biology of the balsam woolly aphid on Mt. Mitchell, N. C. North Carolina J. Econ. Ent. 55(1): 96-98.

Ciesla, W. M. and T. S. Buchanan. 1962. Biological evaluation of balsam woolly aphid, Roan Mountain Gardens, Toecane District, Pisgah National Forest, N. C. USDA, USFS, Div. S&PF, Rpt. 62-93.

Speers, C. F. 1958. The balsam woolly aphid in the Southeast. J. Forestry 56:515-516.